Chapter 1

The Origins of Psychology

Are the things you see, feel, and hear every day only in your mind, or do they exist in the external world? How can you know for sure? How can you know anything for sure? As John Locke, a seventeenth-century philosopher, put it:

> The knowledge of the existence of any other thing we can have only by sensation … For the having the idea of anything in our mind no more proves the existence of that thing than a picture of a man evidences his being in the world.

Questions about the mind were of great interest to philosophers of the seventeenth and eighteenth centuries and can actually be traced back to the Greek philosophers Aristotle and Plato. Although the philosophers' answers contribute relatively little to our current understanding of psychology, their methods of inquiry did. During the nineteenth century philosophers became less reliant on theological and non-empirical explanations of mind and behavior, and more and more dependent on direct observation. However, as the following quote points out, mental philosophy (the term used before psychology became a discipline of its own) was making very little progress in understanding the mind.

> There is no department of knowledge in which so little progress has been made as in that of mental philosophy … No attempt indeed has been made to examine its phenomena by the light of experiment and observation. (Brewster & Miller, 1854)

However, by the middle of the nineteenth century, psychological phenomena such as perception, thought, and learning would be studied scientifically. Rapid advances in the physical sciences using scientific methods suggested that the study of the mind, which had made relatively little progress, might also benefit from a new methodology. This dramatic shift in the way the mind was studied led the way for modern psychology.

We will trace these beginnings of psychology in this first chapter. An appreciation of where psychology has been will help you to see where it is going.

1.1 The Study of Psychology

For many of you, this text will be your first formal exposure to a science that is central to us. Perhaps you have wondered as you were taking some other courses, what has this to do with my life? Psychology has everything to do with your life.

Although we admit to some bias, we do believe that a knowledge of psychology is helpful even to people who do not plan to pursue it as a career. Studying psychology provides insights into why people behave as they do. It also helps us to better understand our own thoughts, feelings, behaviors, and attitudes; and hopefully, it can strengthen our appreciation of, and tolerance for, the wide differences that exist among people.

Psychology investigates a wide variety of questions and attempts to answer them using scientific methods. Among the questions that will be explored in this book are these:

Can something as complex as human behavior be studied scientifically?

What is the relationship between the mind and the brain?

How are our memories represented in the brain?

Psychology Scientific study of the behavior of humans and other animals

Are mental disorders caused by chemical or structural abnormalities in the brain?

What causes some people to overeat and to become obese?

Are dreams necessary? What happens if people are prevented from dreaming?

What do intelligence tests really measure?

Why are you less likely to be assisted in an emergency when there are many bystanders than when in the presence of only a few?

Can one person possess two or more distinct personalities at the same time?

How does psychological stress contribute to illnesses such as heart disease, hypertension, and the flu?

Does psychotherapy help people overcome psychological problems such as depression and anxiety?

Is punishment a more effective method for controlling behavior than the use of reinforcement?

Psychology also helps us evaluate the many so-called psychological facts we encounter every day in the popular media. When was the last time you read a newspaper or magazine article or heard a talk-show host present the latest findings on the meaning of dreams, how to become more successful, or why men behave differently than women? Many people accept such "scientifically based facts" without questioning whether they are founded on reliable evidence. We hope that an understanding of psychology will help you think critically and carefully evaluate such claims. You will see that many of your unquestioned assumptions about human behavior have no scientific basis.

1.2 Definition of Psychology

Formally defined, **psychology** is *the scientific study of the behavior of humans and other animals.* This definition can be separated into three parts: Psychology is a scientific study; it studies behavior; and it includes the study of other animals as well as humans.

1.2a Psychology as a Science

The first part of our definition states that psychology is a scientific study. Indeed, the theories and facts of psychology emerge from the careful application of scientific methods. This aspect of our definition may contradict many people's views of psychology, for it is often assumed that psychology is just a matter of common sense. After all, are we not applying psychology when we mix enough praise with criticism to make a child feel good about changing bad habits, or when we carefully discuss relationship problems with our partners rather than keeping those concerns to ourselves? If syndicated columnists in the daily paper can provide advice for dealing with people, what sets psychology apart as a science?

The purpose of psychology is to give us a completely different idea of the things we know best.

Paul Valéry, poet, essayist, and philosopher

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According to research conducted by Latané and Darley, the presence of other people affects our perception of an emergency situation.

Psychology certainly involves knowing how to deal with people effectively, but it involves a great deal more than this. In fact, dealing with people effectively is only a small part of the science of behavior. As you will soon see, it involves much more than common sense explanations. For example, take a minute to consider the following question:

Would you expect that the number of people present in an emergency could determine whether or not one of them responds with help?

Most people when asked this question immediately reply that the more people present, the more likely someone will help. After all, some individual in the crowd is bound to see the emergency and assist. However, numerous case studies and experiments conducted by psychologists tend to confirm the opposite: Assistance is more likely to be given if very few bystanders are present.

According to research conducted by Latané and Darley (1970), the presence of other people affects our perception of an emergency situation; and we tend to diffuse our responsibility to act in an emergency to others who are present. In a now classic experiment, subjects were asked to participate in an interview about urban life. While waiting to be called to the interview, they were instructed to wait in a specific room and fill out some forms. Some of the subjects waited alone, and others waited in groups of three. After working on the forms for several minutes, smoke began to infiltrate the room through a vent. Observations of the subjects revealed that 63 percent of the subjects working alone noticed the smoke within five seconds while only 26 percent of the subjects working with others noticed it. Subjects working alone also were more likely to report the smoke than subjects working with others.

This research, along with numerous other experiments, has helped to explain bystander apathy. It is only through carefully designed experiments such as these that our common sense assumptions can be validated or refuted.

Psychological research using scientific methods often provides enlightening and reliable information about behavior that we might not otherwise learn. In contrast, relying

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on common sense produces subjective opinions that may have little basis in fact. One only has to look at the history of other sciences to see that psychology is not alone here. It was not all that long ago that stars were known as windows to the heavens and that diseases were believed to be caused by spirits invading the body. As science progresses, subjective opinions and folklore are either confirmed or left behind.

Psychology uses scientific methods to investigate its subject. Many of these methods are discussed in detail in Chapter 2. Despite its careful methodology, however, many questions about behavior remain unanswered by the science of psychology. Much of our understanding of people and behavior is subject to constant review and revision. You will learn that very few psychological principles are carved in stone; new theories as well as technological developments are constantly providing fresh directions and methods for expanding knowledge.

1.2b The Study of Behavior

The second part of our definition states that psychology is the study of behavior. There have been times in the history of psychology, as you will see later in this chapter, when psychology focused almost entirely on unobservable mental processes. At other times, psychologists have been concerned only with behavior that could be observed directly, strictly avoiding any reference to mental processes.

At present, psychologists are interested in studying both behavioral processes and mental processes. It is hoped by many that theories about mental processes can be based on direct observations of behavior. To illustrate how both behavior and mental processes can be the subject matter of psychology, imagine participating in a psychological experiment in which a psychologist displays a moving object on a computer screen. After the object has moved up (or down) the screen for several seconds, it disappears. Your task is to locate the exact spot on the screen where the object disappeared. The psychologist here is interested in both direct measurements (your reported estimate of position) and discovering something about how movement and velocity are represented internally (by developing a theory based on numerous observations). For example, psychologists have found that if the object is moving downward, people tend to exaggerate its velocity by overestimating how far it traveled before disappearing. When the object is moving upward, the velocity estimate is often too low (Hubbard, 1990). Interestingly, these observations are consistent with how "real" moving objects are affected by gravity. That is, as an object goes up, it slows down; when an object is going down, it accelerates *because of gravity*. Thus, it appears as though our mental representations of moving objects have some of the same characteristics as real moving objects. In this example, a theory about a mental process (our representation of movement) is developed through direct observation of observable behavior (placement of the cursor on the computer screen).

Thus, psychology does not solely study behaviors that can be observed directly by onlookers or research scientists (although those observations are an important part of psychology). Nor—contrary to some people's assumptions that all psychologists are interested in is analyzing dreams and probing for repressed memories—does psychology confine itself only to the inner workings of the mind. Instead, contemporary psychologists are often interested in both observable behavior and mental processes.

1.2c The Study of Humans and Other Animals

The third part of our definition states that psychology is the study of humans and other animals. Psychologists study rats, dogs, cats, and pigeons, among other animals; even insects have provided useful information about behavior.

Learning About Psychology from Nonhuman Animals

Students are often surprised to discover that the subject matter of psychology includes the behavior of all animals, not just humans. How can psychologists generalize from rats to people? Why study nonhuman animals when there are so many pressing problems threatening the quality of human lives? Try to formulate at least a few answers to this question before reading on.

There are at least five major reasons why psychology includes the study of animal behavior as well as human behavior. One is the need to find a simpler model. Scientists in all fields generally attempt to understand a particular phenomenon by first studying the simplest examples available in nature. For instance, to understand respiration, metabolism, and other cellular processes, a biologist might first examine them in a simple, one-celled amoeba, rather than in a more complex, multi-celled organism. Similarly, scientists seeking to understand the neurological processes that underlie learning and memory can benefit from examining the nervous system of a relatively simple organism such as a sea slug, which may have about twenty thousand nerve cells, rather than by beginning their investigations with humans, who have about 200 billion nerve cells.

A second reason to study animal behavior is because such research can provide greater control. In a typical experiment, a number of different factors or variables may influence behavior. The more control the experimenter has over these variables, the more precise the conclusions can be. To illustrate, suppose you wanted to study the relationship between environmental noise levels and problem-solving behavior. You might anticipate that a number of variables (such as how rested, hungry, or relaxed a subject is) could also influence problem solving. If you were to use human subjects, it would be hard to control precisely the events occurring in their lives in the 24-hour period before they arrived at your laboratory for testing. In contrast, the life of an experimental animal, such as a monkey, can be controlled twenty-four hours a day. Thus, by using animal subjects, you could carefully monitor important conditions such as levels of hunger, rest, and stress.

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What can we learn about behavior from pigeons?

Ethical considerations are a third reason for studying animals. Psychologists often ask questions that for ethical reasons cannot be addressed initially in research with humans. For example, over the last four decades psychologists involved in brain research have conducted experiments in which they have placed electrodes into the brain to stimulate or record brain activity. You can imagine the ethical questions that would surface if we were limited to human subjects in these pioneering efforts. Just as medical researchers must test experimental drugs extensively with nonhumans before they can begin clinical testing on people, research psychologists cannot apply new laboratory procedures to

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Although psychologists conduct experiments on nonhuman animals, ethics committees review all studies to ensure the welfare of the subjects.

human subjects until they have ruled out the possibility of harmful effects.

The fact that psychologists conduct experiments on nonhuman animals that may be unethical to conduct on humans does not mean that ethical guidelines are not followed in animal research. Quite the contrary, virtually everywhere that research is conducted in the United States, ethics committees (called Institutional Review Boards) review all proposed studies to ensure that the welfare of participants (human or otherwise) is safeguarded. The vast majority of scientists conducting animal research are aware of their responsibilities regarding humane treatment of their subjects and work within the confines of these limitations.

A fourth reason for using nonhuman subjects is a practical one. Animals are readily available for experimentation, often at minimal cost. White rats, for instance, are generally in plentiful supply at a price well within most researchers' budgets. In addition, some experiments require frequent testing of subjects, often over an extended period. Few humans would commit to any kind of research that required more than a few hours conveniently taken from their daily routines. Laboratory animals, on the other hand, are available night and day for as long as is necessary.

Finally, psychologists study the behavior of animals simply to learn more about animal behavior. For example, psychologists and other scientists who study animal behavior have provided important information about the feeding, social, and reproductive behaviors of countless species. This information is critical when developing policy that may affect animal environments. In the northwest United States there is a renewed discussion about the habitats of the Spotted Owl and wild salmon. What effects will extensive logging have on the populations of these species? Only research on the behavior of these species can answer this question.

Even if you acknowledge that animal research has some advantages, you may still be unconvinced that such research is worthwhile. If so, the findings of research psychologist James Olds (Olds, 1973) may persuade you to modify this view somewhat, for his research illustrates how animal studies can have direct value for humans. Olds identified an area within a rat's brain that produces intense pleasure when stimulated electrically (see Chapter 3). His pioneering work encouraged researchers to look for similar pleasure centers in human brains. Their discovery in humans has had many important applications, including pleasure center stimulation to provide relief for severely disturbed psychiatric patients and to counteract debilitating pain in terminally ill patients. Electrical stimulation has also been applied to treat severe seizures associated with epilepsy. More recent research on the neural structures that make up this "pleasure center" has led to a better understanding of drug and alcohol addictions. Without first experimenting on animals, it is unlikely that these treatments would now be available for humans.

We have defined psychology as the scientific study of behavior, yet this definition represents only a contemporary view of psychology. In its short history (the discipline had its formal beginnings only a little over a century ago), the answer to—w*hat is psychology*—has varied considerably, depending on the era in which it was asked. The following section presents a brief overview of the history of psychology.

1.3 Psychology's History

Although psychology is a very young science, its roots go back to antiquity. Since the earliest recorded civilizations, people have been concerned about issues still considered central to present-day psychology. This focus was particularly true for philosophers such as Plato, Aristotle, Descartes, and Locke, who raised provocative questions about human thoughts, feelings, and behaviors.

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Without first experimenting on animals, it is unlikely that there would be treatments or vaccines for diseases, such as Polio or Lupus.

These philosophers speculated about the mind. Where was it located? How did ideas within the mind gain expression in physical actions? By what processes did events in our external environment become part of our awareness? Such questions reflected a fundamental interest in the relationship between mind and body. The early philosophers endeavored to understand this relationship by formulating assumptions and then applying logical thought processes as they reasoned their way to conclusions. While based on logic, this approach had an important limitation because it relied on subjective assumptions about how the world seemed to be, rather than scientific assessments about how the world really is. As a result, logical reasoning of early philosophers sometimes led to inaccurate conclusions.

For instance, the influential seventeenth-century philosopher René Descartes proposed that mind and body are distinct entities that interact at a point represented by the brain's tiny pineal gland. Descartes' position was known as dualism. He believed that the physical body was mechanical and obeyed known laws of physics. The mind or soul, however, was not physical but interacted in some way through the pineal gland to produce intentional behavior. Descartes' dualistic view is summarized in the following statement:

> I here remark, in the first place, that there is a vast difference between mind and body, in respect that body, from its nature, is always divisible, and that mind is entirely indivisible … This would be sufficient to teach me that the mind or soul of man is entirely different from the body. (Descartes)

As you might have guessed, Descartes' ideas have greatly influenced the way we commonly think of mind and body. For example, the concept of free will is central to our everyday assumption that our behavior is influenced by our wants, desires, and intentions. This is contrary to the position that behavior is caused or determined by *physical* events either within or outside of our bodies. This position, referred to as *determinism*, is central to the science of psychology. Determinism assumes that all physical events (including behavior and mental processes) are caused or determined by other physical events. These other physical events include the activity of our nervous system. Many contemporary scientists and philosophers even question whether we have free will at all (Harris, 2012; Wegner, 2002).

Psychology which explains everything explains nothing, and we are still in doubt

Marianne Moore, American Poet

Psychology also has roots in *physiology*, a division of biology concerned with the systematic study of bodily processes. An interest in how the bodies of humans and other animals function led a number of influential nineteenth-century physiologists to begin

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Renè Descartes (1596–1650)

exploring some of the same psychological issues as their philosopher counterparts. However, unlike the philosophers who relied on reasoning and speculation, the physiologists adhered to the concept of *empiricism*, the idea that knowledge is best acquired through observation. These early physiologists were well schooled in the **scientific method**, which involves careful observation of events in the world; the formation of predictions based on these observations; and then the testing of these predictions by further systematic observations.

The physiologists of the mid-nineteenth century provided important new insights into how the brain and the rest of the nervous system influence behavior. For example, in the mid-1800s, a group of German scientists led by Hermann von Helmholtz pioneered a series of experiments in which they measured the speed of conduction of a nerve impulse and assessed the nature of neural communication within the nervous system. By 1870, researchers at the University of Berlin had begun to study the exposed brains of laboratory animals and found that electrical stimulation of certain locations caused specific bodily movements. Studies such as these marked the way for later laboratory research that has helped reveal the relationship between brain processes and behavior.

Thus, while psychology has roots in philosophical questions about the relationship of mind and body, the empirical nature of contemporary psychology and its adherence to the scientific method also reflects the science of physiology, which provided the tools for careful examination of these questions. The next logical step in the evolution of psychology was to take the questions about behavior and mental process posed by philosophy into the laboratory.

1.3a Structuralism

Wilhelm Wundt (1832–1920)

Entering the laboratory is exactly what Wilhelm Wundt, a German scientist trained in physiology, did in the late 1800s. The establishment of Wundt's small laboratory at the University of Leipzig in 1879 marked the formal beginning of psychology as a scientific discipline.

Wundt defined the task of psychology as the systematic study of the structure of the conscious adult mind. He believed that the conscious mental processes involved in such things as perceiving colors, reacting to stimuli, and experiencing emotions could be understood best by breaking them down into their basic elements and then analyzing how the elements were connected with one another. In this sense, he hoped to pattern psychology after the physical sciences of chemistry, physics, and physiology.

Wundt borrowed a tool of philosophy, *introspection* (looking inward), for studying mental processes. For example, subjects listening to music might be asked to break their perceptual experience down into its basic elements of pitch, volume, timbre, and so forth. Subjects were trained in introspection so that they could provide clear reports of their sensations. Wundt also believed that introspection needed to be supplemented by experiments. Therefore, he would systematically vary some physical dimension of a stimulus, such as the volume of a particular sound, to see how sensations changed. This approach came to be known as *experimental self-observation*. Throughout Wundt's career, he continued to emphasize gaining information about the mind from observable, measurable events.

Many of the pioneers of American psychology received their training in Wundt's laboratory in Germany. One of these students, Edward Titchener, brought his mentor's particular brand of psychology to America when he established a psychology laboratory at Cornell

Scientific Method Careful observation of events in the world, the formation of predictions based on these observations and the testing of these predictions by manipulation of variables and systematic observation

University in 1892. Like Wundt, Titchener thought the proper goal of psychology was to describe mental structures. This approach to psychology was called **structuralism**.

Structuralism attempted to develop a kind of mental chemistry by breaking experience down into its basic elements—or structures—in the same way that a substance such as water could be broken down into molecules of hydrogen and oxygen. This approach seemed reasonable at the time because it was proving successful for the sciences of chemistry and physics.

(Wikimedia Commons)

Wilhelm Wundt (1832–1920)

Problems with Structuralism

Can you see any problems associated with trying to break an experience into its basic elements? Will an experience retain its essential character when subjected to this reductionist approach? Think about this question for a few moments before reading on.

Structuralism enjoyed only short-lived popularity. Psychologists soon discovered that introspection, the major research tool of structuralism, often altered the nature of the conscious mental processes they wished to analyze. The next time you find yourself entranced by an exquisite sunset or a haunting melody, stop and pay attention to your sensations, thoughts, and feelings. You will probably find, as did many of the early introspectionists, that analyzing what you are experiencing changes the experience. An even more damaging flaw became apparent when a number of researchers who were using introspection independently of one another discovered that their results were often different. Finally, many American psychologists criticized structuralism as impractical; they thought psychology should offer solutions to the problems of everyday life. This movement toward a more pragmatic psychology culminated in the functionalist school.

1.3b Functionalism

William James (1842–1910)

Perhaps one of the greatest of all American psychologists was William James. James distinguished himself as a writer of psychology, as a reactionist against the introspective method, and by his new approach to investigating the mind. He agreed with the structuralists that psychology should study mental processes. However, he felt that the science would be better served by attempting to understand the fluid, functional, continually changing, personal nature of conscious experience. He was particularly interested in trying to understand mental processes that helped humans and other animals adapt to their environments. Because of his emphasis on the functional, practical nature of the mind, his conception of psychology's proper task became known as **functionalism**. One of the most important events in psychology's history was the publication in 1890 of James's landmark text, *Principles of Psychology*. This two-volume book, which detailed his view of the nature of psychology, is still considered to be one of the most important psychological texts of all time.

Charles Darwin's theory of evolution by natural selection greatly influenced James. According to Darwin, characteristics of a species change or evolve over time as environmental conditions change. Those characteristics that aid in the survival and reproduction of the species are maintained while others are eliminated. For instance, the protective coloration of some types of moths or the opposable thumbs of humans are traits that were preserved because they helped these species adapt to their environments. Similarly, functionalists concluded that psychological states or processes, such as consciousness, also

Structuralism Approach to psychology that attempted to break down experience into its basic elements or structures, using a technique called introspection, in which subjects provided scientific reports of perceptual experiences

Functionalism Approach to psychology that emphasized the functional, practical nature of the mind. Influenced by Darwin's theory of natural selection, functionalists attempted to learn how mental processes—such as learning, thinking, and perceiving—helped people adapt.

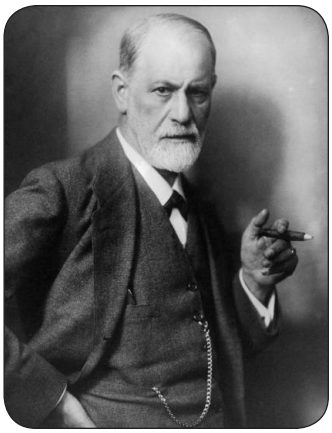
evolved because they served particular functions, such as guiding the activities of the individual. Functionalists wanted to learn how various mental processes—such as perceiving, learning, and thinking—helped people adapt. To accomplish this purpose, they continued to use introspection in their research. However, they also introduced another research method—collecting data from observations of human and animal behavior.

Both structuralism and functionalism played important roles in the development of psychology as a science. Structuralism brought psychology into the laboratory by demonstrating that mental processes were a legitimate focus for scientific research. Functionalism broadened psychology to include the study of nonhuman animals, and it expanded the data of psychology to include observations of behavior. James's contributions have had enduring effects on both psychology and education.

1.3c Psychoanalysis

Sigmund Freud (1856–1939)

During the time when Wundt's structuralism was both active and vital in America, an Austrian physician named Sigmund Freud was developing a new psychological theory.



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Sigmund Freud (1856–1939)

Freud's theory, psychoanalysis, was named after the procedure employed in interviewing patients with neurotic symptoms. One such patient, named Anna O., was particularly significant in the development of psychoanalysis. Anna O. was an attractive woman in her early twenties with severe neurotic symptoms of paralysis, nausea, memory loss, and mental deterioration. Through psychoanalysis, conducted by Freud's mentor Dr. Breuer, Anna O.'s problems appeared to be related to early childhood experiences. Once these experiences were told, usually during hypnosis, some of her symptoms would disappear. This talking cure became known as catharsis and continues to be an important part of psychoanalysis. Early on, it became apparent to Freud that most of his patients' symptoms had a sexual basis. Many of Freud's views, particularly his belief that sexual urges were powerful energizers of human behavior, shocked both professionals and laypeople. His emphasis on the *unconscious mind*, with its irrational urges and drives beyond the control of conscious rational processes, upset many people; it was a blow to human pride to be told that we are often not the masters of our own lives.

Freud's theories are more widely recognized among non-psychologists than are any other school of psychological thought. This is not to say that Freud's analytic approach has been at the forefront of scientific psychology since it was first introduced to America in the early 1900s. Quite the contrary, much of the impact of psychoanalysis lies in the critical reactions it has generated, not on the contributions it has made to modern psychology. Psychoanalysis has been widely criticized, in part because its assertions cannot be tested in the laboratory.

The most complicated achievements of thought are possible without the assistance of consciousness.

Sigmund Freud, "Father" of Psychoanalysis

Despite these criticisms, Freud's impact on psychology was profound. He provided important insights into understanding the emotional lives of people. He encouraged psychologists to consider the impact on behavior of processes not immediately available to conscious inspection. He also helped to legitimize the study of human sexuality. Although psychoanalysis is not a major force in contemporary psychology, the practice of psychoanalysis by psychiatrists treating emotionally disturbed patients continues. We discuss Freud's views in several places throughout the book, particularly in Chapters 14 and 16.

1.3d Behaviorism

The change in psychology from structuralism to functionalism in the United States was both gradual and incomplete. Certainly functionalism did not completely replace the methods of structuralism, and both schools agreed that mental processes were the subjects of psychology. However, in 1913 a revolution against both of these schools occurred. This revolution, initiated by John Watson, was both sudden and quite dramatic. The new and revolutionary approach to psychology was called **behaviorism**.

Behaviorism Scientific approach to the study of behavior that emphasizes the relationship between environmental events and an organism's behavior

John Watson (1878–1958)

Behaviorism was founded in the first few decades of the twentieth century by John B. Watson. Although trained as a functionalist, Watson ultimately came to believe it was impossible to study the mind objectively. He especially opposed the use of introspection, which he considered unscientific; and he chastised the functionalists for not going far enough in their rebellion against structuralism. Watson proclaimed a new psychology, free of introspection, whose task was simply to observe the relationship between environmental events (stimuli) and an organism's responses to them. This stimulus-response (S-R) approach to psychology was a radical departure from Watson's predecessors' focus on mental processes.

The goal of behaviorism was (and still is) to identify the processes by which stimuli and responses become connected or associated—in other words, how we learn. Watson believed that complex human behavior could be analyzed in terms of simple learned associations. The early goal of behaviorism was to discover the rules of association and how combinations of simple associations lead to complex behavior. Watson's work was greatly influenced by the Russian physiologist Ivan Pavlov (1849–1936) and another American psychologist Edward Thorndike (1874–1949), both of whom provided Watson and later behaviorists with new ways of investigating behavior and clues to the rules of association. We will have much more to say about Pavlov and Thorndike in Chapter 6.

Behaviorism quickly caught on, and soon many younger American psychologists were calling themselves behaviorists. Behaviorism continues to exert a profound influence on contemporary American psychology due mainly to the monumental contributions of Harvard's B. F. Skinner (1904–1990). Skinner's major contributions to psychology include his important work in operant conditioning, in which he systematically investigated the effects of reinforcement on behavior. In addition, Skinner's contributions include his extensive writings on language learning, programmed instruction, the philosophy of science, and politics.

Behaviorism is characterized by its insistence upon an empirical, objective science of behavior that has no need for theories of mind or free will. The behaviorist position on the free will-determinism controversy is well summarized in Skinner's statement:

> … the issue of personal freedom must not be allowed to interfere with a science of behavior. … We cannot expect to profit from applying the methods of science to human behavior if for some extraneous reason we refuse to admit that our subject matter cannot be controlled. (Skinner, 1953, p. 322)

More recently psychologists and philosophers have begun to openly question whether free will exists or is merely a functional illusion (Harris, 2012; Wegner, 2002). The concept of free will is to be discussed more in chapter 5, and Skinner and behavioral psychology will be discussed in more detail in Chapter 6. In fact, behaviorism and modern behaviorists will be discussed throughout this book.

1.3e Gestalt Psychology

Wolfgang Köhler (1887–1967)

At about the same time as behaviorism was catching hold in the United States, a group of German psychologists were mounting their own opposition to Wundtian structuralism and the new behaviorism of American psychologists. These scientists, most notably Max Wertheimer, Wolfgang Köhler, and Kurt Koffka, disagreed with the principles and methods of both structuralism and behaviorism. They argued that it was a mistake to try to break psychological processes into basic components such as elementary sensations or simple associations. While structuralists claimed that the perception of objects results from the accumulation of elements into groups or collections, these German psychologists argued that when sensory elements are brought together something new is formed. This something new is our perception of the stimulus. Put another way, the whole (our perception) is more than the sum of its parts (sensory elements). For example, put together a number of simple musical notes and a melody emerges. The melody you hear did not exist in any of the individual notes. This new approach to the investigation of perception was called **Gestalt psychology**.

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Put together a number of simple musical notes and a melody emerges. The melody you hear did not exist in any of the individual notes. Put another way, the whole is more than the sum of its parts. This new approach to the investigation of perception was called Gestalt psychology.

Consider a typical experiment in perception that demonstrates the Gestalt approach. Imagine sitting in front of a computer and being instructed to watch the screen carefully for the emergence of an object. Your task will be to accurately describe what you see during a very brief presentation of stimuli. The experimenter has programmed the computer to present a small red ball on the left side of your screen for about one hundred milliseconds (one-tenth of a second) followed immediately by the presentation of a larger yellow ball on the right side, again for about one hundred milliseconds. Before reading on, think about what you might report seeing. Remember both images were presented so quickly that you really don't recognize them individually.

What subjects typically report seeing in such an experiment is much more than was actually presented. Most likely you would have seen a small reddish orange circle moving across the screen from left to right. As it moved, it appeared to get larger or to move toward you while getting less red and more yellowish-orange. Both the movement and the change in color were constructed by perception and not characteristics of the stimuli themselves. Experiments like these clearly demonstrate that perception is an active, constructive process, not merely the passive detection of stimulus elements.

Because many of our experiences as humans cannot be broken down into separate pieces, Gestalt psychology remains an active force in our present-day investigation of perceptual processes. For example, Gestalt psychologists discovered much of what we now know about producing the illusion of movement through film or through the successive illumination of lights. These and many other perceptual phenomena will be discussed in more detail in Chapter 4.

Gestalt Psychology
Approach to psychology, which argues that the whole of an experience is different from the sum of its parts (Gestalt psychology is an active force in current investigations of perceptual processes and learning as well as therapy, where it emphasizes the whole person)

1.3f Humanistic Psychology

Abraham Maslow (1908–1970)

Although humanistic psychology is still too new to be viewed as a part of psychology's history, we consider it here because it developed out of strong criticism of behaviorism and psychoanalysis.

Humanistic psychology differs from both the psychoanalytic approach and behaviorism in that it does not view humans as being controlled either by events in the environment or by internal, unconscious forces. Humanistic psychologists, most notably Abraham Maslow and Carl Rogers, de-emphasize the influence of both environmental events and unconscious processes in determining human behavior. They argue that the images of man provided by both behavioral and psychoanalytic approaches are incomplete and inaccurate because they do not emphasize what is unique about being human. Instead, humanistic psychologists emphasize the role of *free will* and our ability to make conscious, rational choices about how we live our lives. Humanistic psychologists also believe that people have a natural inclination to fulfill their human potential, a process called *self-actualization*. A person's striving toward self-actualization is seen as the motivating force of behavior.

Although many of humanistic psychology's major tenets are just as difficult to test objectively as are the concepts of psychoanalysis, many psychologists respond favorably to this movement's optimism. Such optimism is in sharp contrast to Freud's psychology, which viewed the outlook for personal fulfillment very pessimistically. Humanistic psychology has increased psychologists' awareness of the importance of such things as love, feeling needed, personal fulfillment, and self-esteem; and, in this sense, its contributions are of value. While humanistic psychology has been criticized sharply for its reliance on a nonscientific approach to understanding human behavior, its proponents have steadily maintained that human behavior is not a subject to be investigated scientifically. As Maslow phrased it, "We are offered beautifully executed, precise, elegant experiments which, in at least half the cases, have nothing to do with enduring human problems" (Maslow, 1965).

1.4 Contemporary Psychology

The previous section briefly introduced the major historical contributions to modern psychology. Many of those approaches have endured and even thrived into the present. For example, modern behaviorism and Gestalt psychology are still quite influential. The methods of psychoanalysis are still taught and practiced widely throughout the United States, and the functional approach of William James is emphasized in contemporary education. Modern psychology, however, is not dominated by any single theoretical approach. Rather, there are many specialties within the field of psychology, and each emphasizes a particular theoretical approach. The following section describes several major areas of specialization that, together with the enduring historical perspectives, define modern psychology.

Humanistic Psychology
Approach to psychology that emphasizes the role of free choice and our ability to make conscious rational decisions about how we live our lives

1.4a Fields of Specialization in Psychology

Cognitive Psychology Approach to psychology that focuses on the ways in which organisms process information, and investigates the processes such as thinking, memory, language, problem solving, and creativity

Developmental Psychology Field of specialization in psychology concerned with factors that influence development and shape behavior throughout the life cycle from conception through old age

Social Psychology Field of specialization concerned with understanding the impact of social environments and social processes on individuals

Personality Psychology Field of specialization that focuses on exploring the uniqueness of the individual, describing the elements that make up human personality, and investigating how personality develops and how it influences people's activities

Cognitive Psychology

Although internal mental processes were considered important in the days of structuralism and functionalism, these processes received little attention while psychology was dominated by behaviorism. Now **cognitive psychology** is refocusing our attention on processes such as thinking, memory, language, problem solving, and creativity. Although some of these are problems currently studied by behaviorists, cognitive psychologists are more interested in internal mental processes, as opposed to behavioral processes. For example, a cognitive psychologist might describe your ability to navigate through campus in terms of internal representations or *cognitive maps* of your environment. They are interested in how these "maps" are constructed and the characteristics of the representations. A behavioral psychologist, on the other hand, might explain this same ability to navigate in terms of stimulus control and learning. The major difference would be the cognitive psychologists' reference to internal, mental processes, as opposed to observable stimulus events and learned behavior. Both of these approaches are discussed throughout this text.

Developmental Psychology

Another important field is **developmental psychology**. Psychologists in this field are interested in factors that influence development and shape behavior throughout the life cycle, from conception through old age. These specialists typically focus on a particular phase of the growth process, such as adolescence or old age, and examine how a particular ability or trait unfolds during that phase of development. For example, a developmental psychologist might investigate how the viewing of television violence influences the development of aggressive behavior in children. Chapters 11 and 12 are devoted to the study of human development.

Social Psychology

Social psychology is concerned with understanding the impact of social environments on the individual. Social psychologists are interested in attitude formation and change, social perception, conformity, social roles, prejudice, interpersonal attraction, and aggression. These topics will be discussed in detail in Chapter 17.

Personality Psychology

Personality psychology explores the uniqueness of the individual and describes the key elements that provide the foundation for human personalities. There is considerable diversity of opinion among personality theorists as to what factors constitute the major components of personality. For example, do our personalities consist of three interacting and sometimes conflicting forces (the id, ego, and superego) described by Sigmund Freud, or are we better characterized as a composite of sixteen primary traits, as suggested by Raymond Cattell? Perhaps as you read Chapter 14, you will form your own opinion on this matter. Many personality psychologists devote their professional careers to investigating how personality develops, evolves, and influences people's activities.

Experimental Psychology

Psychologists in every area of specialization usually conduct experiments at some point in their careers. Thus, it may be a bit misleading to call **experimental psychology** a separate field. Nevertheless, approximately 4 percent of the profession classify themselves as experimental psychologists whose primary activity involves conducting research.

In Chapter 2 we discover that psychologists use a number of research methods in their efforts to understand the nature and causes of behavior. Most experimental psychologists prefer to conduct research in a laboratory setting where they have precise control over the varied factors that influence behavior. For example, an experimental psychologist might investigate the relationship between sexual response and alcohol consumption by precisely measuring sexual arousal to erotic stimuli at different levels of alcohol consumption (the results of these experiments are discussed in Chapter 2.)

Experimental Psychology
Field of specialization in which the primary activity is conducting research

Biological Psychology
Branch of neuroscience, also known as physiological psychology, that focuses on the relationship between behavior and physiological events within the brain and the rest of the nervous system

Clinical Psychology Area of specialization involved in the diagnosis and treatment of behavioral problems

Counseling Psychology
Area of specialization involved in the diagnosis and treatment of problems of adjustment (Counseling psychologists tend to focus on less serious problems than do clinical psychologists; they often work in settings such as schools.)

Biological Psychology

Still another field, **biological psychology** (also called physiological psychology or neuroscience), studies the relationship between physiological processes and behavior. Biological psychologists investigate such things as the brain structures and processes involved in emotion, learning, memory, and psychological disorders. Biological psychologists are also interested in the effects of drugs on behavior. Biological psychology is the topic of Chapter 3, but its contributions to psychology as well will be discussed throughout this text.

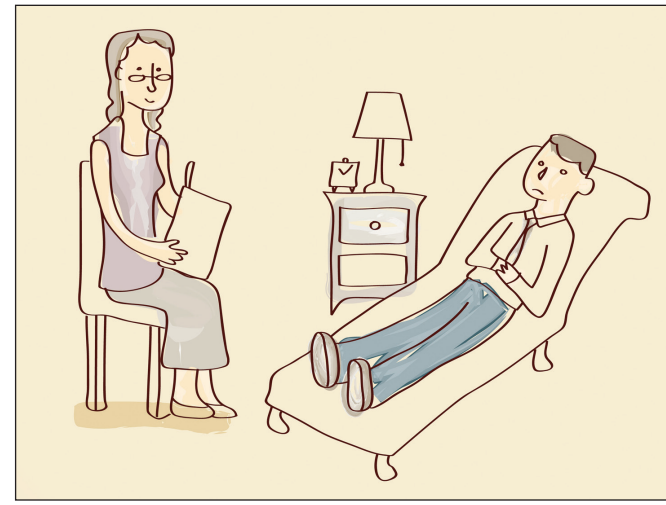
Clinical and Counseling Psychology

A large portion of the psychologists in the United States are engaged in either of two closely related fields: **Clinical psychology** and **counseling psychology**. Both of these groups of psychologists are involved in the diagnosis and treatment of psychological problems, including such things as developmental disorders, substance abuse, relationship difficulties, vocational and educational problems, and behavior disorders.

While a great deal of overlap exists between counseling and clinical psychology, it is generally accurate to state that individuals specializing in counseling psychology tend to focus on less serious problems of adjustment than do their counterparts in clinical psychology. Thus, a counseling psychologist in a high school, college, or university setting might assist students with problems of social or academic adjustment or provide guidance in the area of career decisions. In contrast, clinical psychologists are more likely to work in mental health clinics, mental hospitals, juvenile and adult courts, medical schools, and prisons. Specialists in both areas often see clients in a private practice.

Clinical psychology and *psychiatry* are often confused since professionals within these respective fields often perform comparable functions, such as providing psychotherapy. However, these occupations differ in several important ways.

Most clinical psychologists obtain a doctor of philosophy degree (PhD) that is likely to consist of three to five years of university graduate school



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More than half of psychologists in America engage in clinical or counseling psychology, which diagnose and treat psychological problems.

instruction in psychological theory, research methods, techniques of clinical diagnosis, and psychotherapy strategies, followed by a one-year internship in an institutional setting. In contrast, a psychiatrist is a medical doctor who undergoes several years of specialized training in psychiatry after earning a doctor of medicine degree. Of the two, psychiatrists are more likely to provide medical treatments, such as drugs, in treating psychological disorders. However, clinical psychologists are gaining prescription privileges in some states.

Clinical psychologists and psychiatrists may also differ somewhat in their perspectives about the causes of psychological problems and appropriate treatment for such difficulties. For example, psychiatrists are more inclined to look for physical causes, such as abnormal brain chemistry or hormonal imbalances, and to use medical or biological therapies as remedies for disorders. In contrast, clinical psychologists tend to emphasize psychosocial causes, such as inappropriate learning, faulty attitudes, and disturbed interpersonal relationships, and to focus on psychotherapy as the best road to improvement. Exceptions to these generalizations are not uncommon, however; and clinical psychologists and psychiatrists sometimes meld their respective skills as they collaborate in the design and implementation of treatment strategies.

Educational and School Psychology

Many important discoveries in psychology have direct application to the educational process. **Educational psychology** involves the study and application of learning and teaching methods. Psychologists in this field conduct research on ways to improve educational curricula, and they often help train teachers. They may work in primary or secondary schools, but more often they are found in a university's school of education.

School psychology encompasses work in elementary or secondary schools, dealing primarily with the evaluation of student's abilities and interests. School psychologists use a variety of methods including personality, interest, and ability tests to evaluate students and to assist schools in developing programs for gifted and challenged students. School psychologists may also assist educators in attempts to resolve student learning and emotional problems. These psychologists are a valuable resource for students and teachers.

Educational Psychology Field of specialization in psychology concerned with the study and application of learning and teaching methods, focusing on areas such as improving educational curricula and training teachers

School Psychology Field of specialization concerned with evaluating students' interests and abilities and resolving learning and emotional problems

Industrial/Organizational (I/O) Psychology Field of specialization concerned with using psychological concepts to make the workplace a more satisfying environment for employees and management

Engineering Psychology Field of specialization concerned with creating optimal relationships among people, the machines they operate, and the environments they work in, sometimes called human factors psychology

Industrial/Organizational Psychology

The field of **industrial/organizational (I/O) psychology** uses psychological concepts to make the workplace a more satisfying environment for both employees and management. I/O psychologists may work with businesses either as company employees or as consultants, designing programs to improve morale, increase job satisfaction, foster better communication within the corporation, enhance productivity, and increase workers' involvement in decision making. They are also frequently involved in designing job-training programs and in selecting the most suitable people for a particular job.

Engineering Psychology

Engineering psychology (sometimes called human factors psychology) focuses on the creation of optimal relationships among people, the machines they operate, and the environments in which they work. For example, engineering psychologists have helped

design the lighting and instrumentation within the cockpits of sophisticated aircraft to maximize pilot efficiency. These professionals have also been involved in the U.S. space program, helping to develop optimal functional efficiency within the severely limited confines of spacecraft.

Health Psychology

In recent years there has been a mounting interest in achieving and maintaining good health, both physical and psychological. Psychologists have known for many years that emotional conditions such as stress or depression often play a major role in the development of physical ailments such as ulcers, skin diseases, stomach disorders, infectious diseases, and probably even cancer. Increasing evidence also indicates that psychological factors have a great deal to do with prevention of and recovery from illness. This growing body of data on the interaction between physical and psychological health factors has led to the emergence of a dynamic new area of specialization known as **health psychology**. In recognition of the importance of this new field of study, the National Institutes of Health (NIH) recently designated health psychology as a priority training area and allocated funds for developing training programs within psychology departments throughout the country.

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Health psychologists are active in areas such as developing programs to help people reduce stress.

Health psychologists are currently active in such diverse areas as assessing the psychological and physical effects of stress; developing programs to help people reduce stress in their lives; studying coping strategies for dealing with serious or catastrophic illness; evaluating the impact of psychological factors on diseases such as cancer and cardiovascular illness; devising ways to test people for susceptibility to disease; and seeking to identify the factors that motivate people to engage in health-threatening activities such as smoking, overeating, and undereating (Brannon & Feist, 2010). Throughout this text we will comment on current research related to our health.

Positive Psychology

In his 1998 address as president of the American Psychological Association (APA), Martin Seligman proposed that scientific psychology investigate "the understanding and building of the most positive qualities of an individual: Optimism, courage, work ethic, future-mindedness, interpersonal skill, the capacity for pleasure and insight, and social responsibility." This address marked a movement which would become known as **positive psychology**, focused on understanding factors contributing to self-fulfillment and happiness. While it is far too early to evaluate the success of these research efforts, it is clear that psychology as a scientific endeavor has focused most of its attention on understanding pathology and abnormal behavior, and not nearly enough of its efforts towards understanding characteristics of healthy people. Can adopting an optimistic, future-oriented attitude towards life contribute to greater happiness, life satisfaction and health? Although there is no lack of speculation here, science is only just beginning to investigate questions like these.

Health Psychology Area of specialization concerned with the interaction between behavioral factors and physical health

Positive Psychology The study of human behavior aimed at discovering and promoting the positive strengths and attributes that enable individuals to thrive and to succeed

Forensic Psychology

Forensic psychology is another specialty. It works hand in hand with the legal, court, and correctional systems. Forensic psychologists assist police in a variety of ways from developing personality profiles of criminal offenders to helping law-enforcement personnel understand problems such as family conflict and substance abuse. They may also assist judges and parole officers in making decisions about the disposition of convicted offenders. The 1991 case of Jeffrey Dahmer, who murdered, dismembered, and apparently ate selected body parts from numerous victims, attracted the attention of both the public and forensic psychologists. Before reading on, you might consider whether Dahmer was competent to stand trial, or whether he was insane and thus didn't understand the nature of his crimes.

Artificial Intelligence and Connectionism

Artificial intelligence (AI) captured the interest of many in 1997 as they witnessed IBM's chess-playing computer Deep Blue defeat Garry Kasparov, the world chess champion. Although chess-playing computers have gained our attention, AI researchers attempt to develop models that simulate a variety of complex human cognitive processes such as perceiving stimuli, solving problems, learning, and making decisions. AI theorists are hopeful that as they become more proficient in designing sophisticated computer models of cognitive processes, they will achieve a better understanding of how we think, learn, and how we perceive our surroundings. AI has a practical side as well, as evidenced by its successful application to such varied pursuits as the diagnosis of illness and the location of deposits of valuable resources such as oil.

Connectionism is a relatively new approach to studying complex human abilities such as learning, problem solving, and perception. Like artificial intelligence, it too employs computer models to help solve these problems. However, connectionist researchers are attempting to design computer hardware that simulates the kinds of parallel connections among neurons in the brain. These connectionist machines have proven to be much more powerful than their predecessors for certain kinds of tasks, including pattern recognition, perception, problem solving, and learning.

Forensic Psychology Field of specialization that works with the legal, court, and correctional systems to develop personality profiles of criminals, make decisions about disposition of convicted offenders, and helps law enforcers understand behavioral problems

Artificial Intelligence (AI) Field of specialization in which researchers develop computer models to simulate human cognitive processes and to solve problems

Connectionism The learning theory proposed by Thorndike that learning is the result of forming associations or connections between stimuli and responses (modern connectionism is focused on discovering the neurobiological mechanisms underlying learned associations)

Evolutionary Psychology A recent approach to both investigating and explaining human behavior in terms of natural selection

Evolutionary Psychology

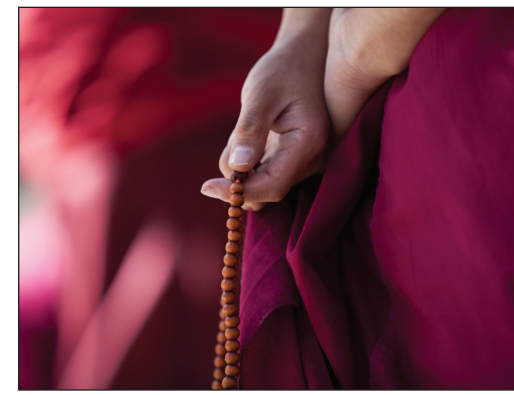
Evolutionary psychology is a recent approach to both investigating and explaining human behavior in terms of natural selection. Modern evolutionary psychology can be traced to early writings of Charles Darwin including *The Descent of Man* (Darwin, 1871) and *The Expression of the Emotions in Man and Animals* (Darwin, 1872). In these writing Darwin expressed his views about sexual selection and the adaptive significance of human and animal traits. As you might expect, these works, along with his others, have been hotly debated since their original writing.

Evolutionary psychologists argue that traits which tend to occur across many cultures may be a result of selection pressures. Some examples of these traits include our perceptions of sexual attractiveness, marriage patterns, cooperation, facial expressions of emotion, specific fears, and perhaps even religious beliefs. These universal traits, according to evolutionary psychologists, are rooted in our genes and provided our ancestors with reproductive and survival advantages. For example, evolutionary psychologist David Buss (1989) has proposed that the features we find sexually attractive in the opposite sex are universal and genetically based. Men, he argues, find women attractive

when they are healthy and fertile-appearing. This includes features such as a narrow waist (about one-third the width of their hips), luscious hair, large breasts, and a youthful appearance. Women, on the other hand, prefer features that predict a potential for longer-term mating, and an investment (time and resources) in them and their offspring. These features include maturity, dominance, and affluence. In a recent study, men found women to be equally attractive regardless of whether they were pictured in a modest or an expensive-looking car. Women, however, found men to be more attractive if they were pictured in the expensive-looking car (Dunn & Searle, 2010). The authors suggest that perceived wealth and status enhance male attractiveness, much as perceived youth and fertility enhance female attractiveness. There will be more discussion of evolutionary psychology and attractiveness in Chapter 17.

Cultural Psychology

Cultural psychology investigates how cultural and religious traditions and practices shape and contribute to differences in human behavior. Of recent concern to cultural psychologists is how western and Islamic cultural traditions contribute to significant differences in ways of life. These differences in tradition will continue to be roadblocks to peace and democracy-building in Iraq and Afghanistan. For example, Islamic culture has vastly different views than the West about the purpose of life and the role of women in society. In Islam, life's purpose is to serve Allah Ta'ala by sacrificing wealth, personal pleasure, and time. In contrast, the purpose of life in Western culture is prosperity, worldly enjoyment, and self-fulfillment. These cultural differences contribute to distrust, misunderstanding, and strife. Western travelers are often unwelcome in foreign countries because of stereotypes about Western cultural insensitivities. Cultural psychologists hope to not only create greater cultural awareness, but to incorporate cultural differences into modern psychological theory.



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A part of cultural psychology is to investigate how religious traaditions and practices influence human behavior.

1.4b Careers in Psychology

Many beginning psychology students believe that most psychologists work in counseling or clinical settings dealing with people adjusting to problems of living. The previous section on areas of specialization in psychology suggests psychologists do a wide variety of things. While many psychologists do work as counselors or therapists, most do not. The following figure illustrates where most psychologists work.

Psychological Associations

During its brief history, psychology has grown by leaps and bounds. The **American Psychological Association (APA)**, the major professional organization of psychologists in the United States, was founded in 1892 by thirty-one charter members. The APA now has more than 137,000 members, and there are countless numbers of professional psychologists who are not listed in its membership (APA, 2012). As the APA's ranks have increased, so have the numbers of fields within the profession. There are some generalists, just as there are general practitioners in medicine. However, most

Cultural Psychology A field that investigates how cultural and religious traditions and practices shape and contribute to differences in human behavior

American Psychological Association (APA) The major professional organization of psychologists in the United States

Association for Psychological Science (APS) Professional group of academic and research psychologists founded in 1988

psychologists find that as their careers evolve they become increasingly specialized in both their interests and professional activities. The APA presently recognizes fifty-four divisions or specialties within psychology. Even with an increasing number of divisions within the APA, many members believe that the mission of the APA is directed more towards clinical applications than towards basic research. As a result, a separate psychological association was organized.

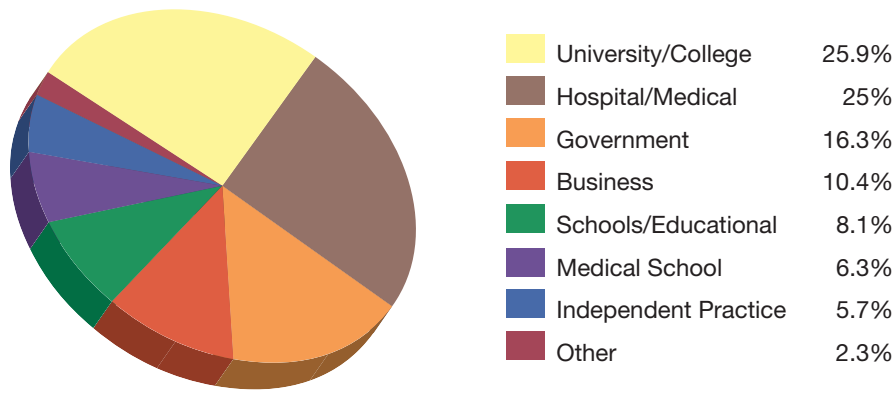
In 1988 the **Association for Psychological Science (APS)** was founded with the stated purpose of better representing the academic and research interests of psychology and to more effectively promote psychology as a science. Today there are more than twenty-three thousand members of the APS (APS, 2012).

1.5 The Goals of Psychology

Essentially all scientists, psychologists included, share the common goals of *understanding, predicting,* and *controlling* or *influencing* the phenomena that constitute the subject matter of their respective disciplines. A biologist, for example, after first acquiring an understanding of how the SARS virus invades a healthy body, might then seek to predict conditions under which infection is likely to occur and follow this with efforts to control or influence the infectious process in a manner that minimizes transmission of the virus. Similarly, a psychologist might seek to understand the mechanisms whereby our psychological and physiological responses to stress increase our susceptibility to disease, in order to predict which of us are likely to develop coronary heart disease, hypertension, or other stress-related diseases. The psychologist might also try to apply this knowledge to influence or modify certain behaviors that make people susceptible to the ravages of stress.

While many of us accept the goal of using psychological knowledge to understand and predict behavior, the idea of applying psychology to control people's behavior is more controversial. What do you think of this goal? Is it a legitimate aim of psychology? Always? Sometimes? Never? Give some thought to this complex issue before reading on.

Figure 1-1 Where Most Psychologists Work (APA, 2012)



People often react with concern or skepticism to the notion that behavioral control is a legitimate goal of psychology. Indeed, it would be misleading to imply that all the knowledge acquired through psychological research leads directly to behavioral control. Nevertheless, psychologists have been able to influence behavior under a wide variety of situations. For example, understanding the processes and predicting the circumstances under which prejudices are formed has resulted in the development of educational programs that have reduced the formation and expression of prejudicial behavior in some schoolchildren (see Chapter 17). Similarly, knowledge about the psychobiological causes of certain severe psychological disorders has provided the impetus for developing various therapies effective in controlling certain disruptive symptoms, as we will see in Chapter 15.

People seldom object to such examples of legitimate and helpful behavioral control. However, there are many gray areas in which the wielding of psychological influence over various behaviors is more controversial; such situations raise important questions. For instance, is it appropriate for industrial psychologists to manipulate work conditions in a manner known to increase worker productivity, or for forensic/clinical psychologists to subject imprisoned sexual offenders to extremely aversive or negative stimuli in order to reduce inappropriate sexual arousal patterns? Such questions suggest that the pursuit of the goal of controlling behavior is often modified or tempered by complex ethical issues.

Although psychology in its relatively short history has managed to accumulate in-depth knowledge about many important areas of human behavior, a vast array of questions remains to be answered. Actually, all science never really finishes its pursuit of the previously outlined goals. However, most disciplines are much further along in their journey toward understanding, prediction, and control than is the infant science of psychology. Nevertheless, this incompleteness of knowledge is in many ways parent to much of the excitement, anticipation, and vitality of contemporary psychology.

Most of our present understanding of behavior and mental processes must be evaluated cautiously with a healthy realization that little in this developing discipline should be considered absolute. Thus, for the most part, our understanding of varied behavioral phenomena is couched in the language of theories. Theories are testable and logical explanations for all of the relevant data or facts scientists have observed regarding certain natural phenomena. For example, psychologists who study sleep and dreaming might formulate theories about why we need sleep or why we dream. Some dream researchers have noted that people spend more time dreaming when they are experiencing relationship conflicts, problems at work, or other emotionally stressful situations. These and similar observations have generated a theory of dreaming that views dreams as a relatively safe, low-stress way to deal with problems that occur during working hours.

A good psychological **theory** generates predictions, or **hypotheses**, which are assumptions about how people should respond under certain conditions, assuming the overall theory is correct. Hypotheses can be subjected to empirical tests in which scientists manipulate conditions or behaviors and observe the results. Thus, a psychologist who adheres to the theory that dreaming allows people to deal with emotional problems might set up an experiment to test the hypothesis: People who are presented with waking-state problems and then deprived of nighttime dreaming will be less likely to suggest reasonable solutions the following morning than are other subjects who are allowed a normal night's rest (see Chapter 5 for a discussion of research supporting this hypothesis).

This scientific approach to understanding human behavior differs from some of our common conceptions and practices. For instance, how often do we hear post hoc

Theory A logical explanation for all of the relevant data or facts scientists have observed regarding certain natural phenomena (an essential aspect of scientific theories is that they must be both testable and refutable, not to be confused with the common usage of the term used to signify a hunch, a speculation, or an opinion)

Hypothesis Statement proposing the existence of a relationship between variables, typically as a tentative explanation for cause and effect; hypotheses are often designed to be tested by research

Hindsight Bias The tendency to believe we could have foreseen an event, after it has occurred

explanations of a variety of phenomena? Consider the news woman who tells us that a murderer was himself the victim of child abuse and this caused his behavior, that a relationship failure was a consequence of a recently disclosed affair, or that a bout of depression was the cause of a recent financial loss. It's far too easy to explain an event after the fact. It is far more difficult to predict it. This tendency to explain events after they have occurred, as if we could have foreseen it, is referred to as **hindsight bias**. With the aid of hindsight it is easy to explain a wide variety of behavioral phenomena. The problem is, we will never really know for sure what caused the man to murder, the relationship failure, or the bout of depression. We will see throughout this book that hindsight biases and intuition may be right occasionally, but they are far more often wrong. You will learn that testing hypotheses with experimental methods has refuted many common assumptions about human behavior and that psychology as a scientific endeavor is progressing rapidly. We will say more about scientific theories and hypothesis testing in Chapter 2.

We have considered in some detail the history, scope, and goals of the science of psychology. In Chapter 2, we will look more closely at some of the methods psychologists have developed for exploring the many questions posed by the richly varied behaviors of humans and other animals. An appreciation of the methods used by psychologists will help you to critically evaluate the numerous facts and opinions presented throughout this book.

CHAPTER REVIEW

Definition of Psychology

1. Formally defined, psychology is the scientific study of the behavior of humans and other animals.
2. The theories and facts of psychology emerge from the careful application of scientific methods.
3. Psychology includes the study of animal behavior as well as human behavior. Nonhuman animal research offers several advantages, including providing a simpler model, the benefits associated with greater control afforded by nonhuman subjects, ethical considerations, time and cost factors, and the advantages of short life spans in assessing genetic contributions to behavior.

Psychology's History

4. Psychology has roots in both philosophy, which posed many of the important questions, and physiology, which provided the tools for careful, scientific examination of these questions.
5. The establishment of Wilhelm Wundt's laboratory at the University of Leipzig in 1879 marks the formal beginnings of psychology as a scientific discipline.
6. Wundt employed the methods of introspection and experimental self-observation to pursue what he considered to be the task of psychology: The systematic study of the structure of the conscious adult mind.
7. Edward Titchener, who brought Wundt's brand of psychology to the United States, introduced the label structuralism to describe his attempt to develop a kind of mental chemistry by breaking experience down into its basic elements or structures.
8. Structuralism soon gave way to the more practical psychology of William James, who emphasized the functional, practical nature of the mind. His conception of psychology's proper task became known as functionalism.
9. During the period when psychology was struggling to become more scientific and objective, Sigmund Freud traveled a different road as he developed his highly subjective psychoanalytic approach with its emphasis on the unconscious mind and repressed irrational urges and drives.
10. In the first few decades of the twentieth century, a new force in psychology called behaviorism emerged. This approach, championed by John B. Watson, defined the task of psychology as one of simply observing the relationship between environmental events (stimuli) and an organism's response to them. Modern behaviorism continues to be a powerful force within psychology today.

11. At the same time that behaviorism was catching hold in the U.S., a group of German psychologists decried the principles of both structuralism and behaviorism. They argued that it was a mistake to try to break psychological processes into basic components such as elementary sensations or stimuli and responses because the whole of an experience is different than the sum of its parts. This approach became known as Gestalt psychology.
12. Humanistic psychology de-emphasizes the impact of both stimulus-response events and unconscious processes in determining human behavior. Instead, it focuses on the role of free choice and our ability to make conscious rational choices about how we live our lives.

Contemporary Psychology

13. In recent years the emergence of cognitive psychology as an important force in psychology has led to a refocusing of attention on processes such as thinking, memory, language, problem solving, and creativity.
14. Two other important areas in psychology that are achieving increasing prominence in the field are connectionism, which uses computers to help develop models of cognitive processes and learning, and biological psychology, the study of the relationship between behavior and physiological events that occur within the brain and the rest of the nervous system.
15. Both clinical and counseling psychologists are involved in the diagnosis and treatment of psychological problems. Individuals specializing in counseling psychology tend to focus on less serious problems of adjustment than do their counterparts in clinical psychology.
16. While psychologists in every area of specialization usually conduct experiments at some point in their careers, individuals who classify themselves as experimental psychologists devote their primary efforts to conducting research.
17. Biological psychologists study the relationship between physiological processes and behavior.
18. Educational psychologists focus their efforts on the study and application of learning and teaching methods.
19. School psychologists work in elementary or secondary schools, where they seek to evaluate and resolve learning and emotional problems of students.
20. Industrial/organizational psychology is concerned with using psychological concepts to make the workplace a more satisfying environment for both employees and management.
21. Engineering psychologists focus on creating optimal relationships among people, the machines they operate, and the environments in which they work.
22. Developmental psychologists investigate the factors that influence development and shape behavior throughout the life cycle.

23. Social psychologists seek to understand the impact of social environments and social processes on the individual.
24. Personality psychologists focus on exploring the uniqueness of the individual and describing the key elements that provide the foundation for human personalities.
25. Health psychologists are interested in behavioral contributions to disease such as smoking, drinking, lack of exercise, social isolation, and stress.
26. Positive psychology emphasizes the positive characteristics of individuals. Research includes the study of happiness, self-fulfillment, future orientation, and optimism and how these characteristics lead to an improvement in life outlook and productivity.
27. Forensic psychology is the study of criminal behavior and the law.
28. Evolutionary psychology examines the adaptive value of universal traits and how they may be a consequence of natural selection.
29. Cultural psychologists examine the role of cultural and religious traditions in shaping differences in human behavior.

The Goals of Psychology

30. The goals of psychology include understanding, predicting, and controlling behavior.
31. For the most part, our understanding of behavioral phenomena is expressed in the language of theories. Theories are tentative attempts to organize and fit into a logical framework all relevant data or facts regarding certain phenomena.
32. Good psychological theories generate hypotheses, which are assumptions about how people should respond under certain conditions, assuming the overall theory is correct.

TERMS AND CONCEPTS

American Psychological Association (APA), pg. 19
Artificial Intelligence (AI), pg. 18
Association for Psychological Science (APS), pg. 20
Behaviorism, pg. 11
Biological Psychology, pg. 15
Clinical Psychology, pg. 15
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True or False

___ 1. Psychology is a science because it deals with both animal and human behavior.

___ 2. One of the main benefits that the science of psychology received from its roots in philosophy is that philosophy emphasizes the use of observation to acquire knowledge.

___ 3. Although they were in general agreement with the principles of behaviorism, Gestalt psychologists had major disagreements with the principles of structuralism.

___ 4. Biological psychologists might investigate the effects of both drugs and brain damage on behavior.

___ 5. The goals of psychology are to understand, predict, and control (or influence) behavior and mental processes.

Multiple Choice

6. What are psychologists interested in studying today?
   a. Behavior
   b. Mental processes
   c. Both behavior and mental processes
   d. Neither behavior nor mental processes

7. What was an approach to psychology that attempted to break down experience into its basic elements?
   a. Structuralism
   b. Psychoanalysis
   c. Functionalism
   d. Behaviorism

8. What was the approach to psychology that emphasized the practical nature of the mind and believed that processes such as consciousness helped people adapt?
   a. Gestalt psychology
   b. Functionalism
   c. Humanistic psychology
   d. Structuralism

9. Why has the psychoanalytic approach been widely criticized?
   a. Psychoanalysis does not help patients.
   b. Its assertions cannot be tested with scientific methods.
   c. It ignores mental processes.
   d. It does not include the study of animals.

10. "An empirical, objective science of behavior that has no need for theories of mind or personal freedom" characterizes which of the following?
    a. Gestalt psychology
    b. Humanistic psychology
    c. Structuralism
    d. Behaviorism
11. On what does Gestalt psychology focus?
    a. The most basic elements of our experiences
    b. Gaining an understanding of the unconscious mind
    c. The relationship between environmental stimuli and an organism's response to them
    d. The constructive processes of perception
12. Which of the following is a false statement?
    a. Humanistic psychologists emphasize the role of free choice.
    b. Humanistic psychologists view people as being controlled by events in their environment.
    c. Humanistic psychologists have an interest in topics such as self-esteem and personal fulfillment.
    d. Humanistic psychologists de-emphasize the influence of unconscious processes.
13. An _____ psychologist would be concerned with the workplace being organized for optimal efficiency; while an _____ psychologist would be concerned that the workplace provided a satisfying environment.
    a. Engineering / environmental
    b. Engineering / industrial/organizational
    c. Industrial/organizational / engineering
    d. Industrial/organizational / environmental
14. John Hinkley's (President Reagan's attempted assassin) psychological profile would probably have been created by a(n) _____ psychologist.
    a. Personality
    b. Forensic
    c. Social
    d. Organizational
15. The goal of psychology, which is sometimes perceived as controversial, is which of the following?
    a. Understanding behavior
    b. Generating behavior
    c. Controlling behavior
    d. Predicting behavior

Answer Key: 1.F 2.F 3.F 4.T 5.T 6.c 7.a 8.b 9.b 10.d 11.d 12.b 13.b 14.b 15.c